

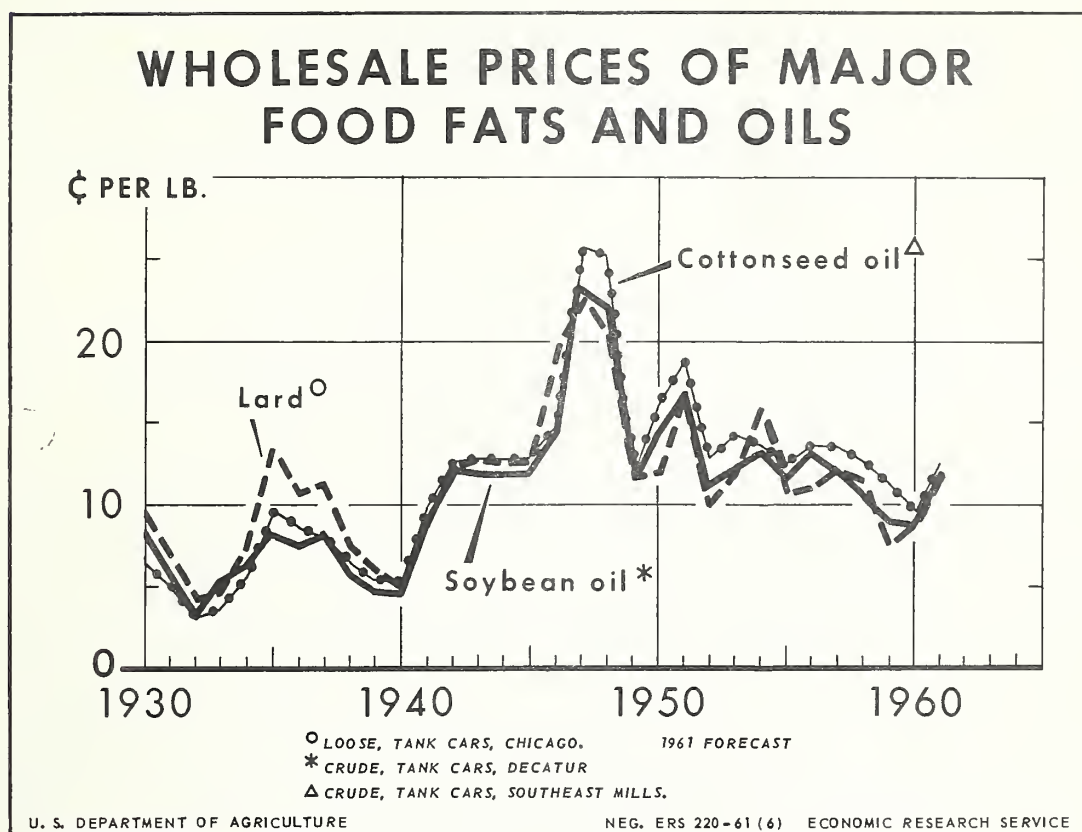
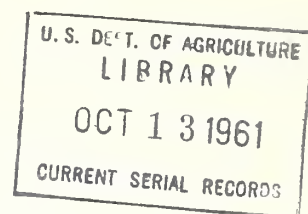
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PRICES OF MAJOR FOOD FATS AND OILS CLOSELY RELATED  
By  
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## PRICES OF MAJOR FOOD FATS AND OILS CLOSELY RELATED

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Wholesale prices of the major food fats--soybean oil, cottonseed oil, and lard--generally move together and, except for short time variations, their relationships to each other tend to hold constant. This "togetherness" of these prices reflects primarily the high degree of substitution and interchangeability of the three fats in manufactured food products. When one of the three get out of line with the other two competitive fats in the general price structure, manufacturers who use that fat in their products switch to a lower priced substitute fat to as great an extent as possible. There are many uses made of these food fats but the more important are in margarine, shortening, and cooking and salad oils.

Two Types of Demand for Food Fats

The extent to which other fats and oils can be substituted for a particular fat in question depends on the nature of the demand that the manufacturer has for it--that is, whether the demand is chiefly noncompetitive or competitive.

The noncompetitive or "fixed" demand schedule consists of the amount of a given fat or oil in a product for which the manufacturer believes there is no substitute regardless of price. For some products, the amount for which there is no substitute may be all the fat in the product; for other products it is the minimum proportion of the fat that the manufacturer believes must be that kind in order to obtain the standardized product he desires.

Sometimes the demand for a given fat is noncompetitive because other possible substitutes do not have the characteristics wanted. Cottonseed oil, for example, has long been considered an excellent oil for products to be used for deep-fat frying because of its relative stability when subjected to cooking heat. Many users are reluctant to use soybean oil and lard for this purpose; therefore, these other two fats are not competitive in these products for these users.

Sometimes the demand for a given fat is noncompetitive because other fats that are otherwise suitable cannot be used without a costly change in the manufacturing process--or without expensive labeling changes.

A manufacturer's competitive demand for a fat consists of the amount of fat in the product over and above the amount that makes up the noncompetitive demand. Fats and oils to satisfy the competitive demand are selected mainly on the basis of price and available supply. In recent years, for example, there has been a sharp growth in the use of soybean oil as compared with the use of cottonseed oil--both because of favorable prices and because of increase in

supply. The rapidly increasing supply of soybean oil has been used mainly in shortening, margarine, and salad oils; it has displaced some cottonseed oil for these uses. The supply of cottonseed oil has been well above its fixed demand and the excess has kept the price of cotton oil competitive with that of soybean oil.

Also in recent years, the competitive demand for lard for use in shortenings has increased many fold—for two main reasons. First, technical developments facilitated the use of lard as an ingredient in manufactured shortenings. Second, lard prices relative to soybean oil and cottonseed oil have decreased sharply. During 1930-40, lard prices averaged about 28 percent more than either of the two oils. From 1947-60, lard prices averaged 4 percent lower than soybean oil and 14 percent lower than cottonseed oil.

### Analysis Of Annual Price Movements

The close association of the prices of soybean and cottonseed oil and lard can be measured statistically by means of simple correlation analysis of annual data.

As table 18 shows, prices of cottonseed oil (CSO) during 1930-60 averaged 10 percent or 1.0 cents per pound above soybean oil (SBO) for the entire period. The annual price changes in these two oils not only moved together in the same direction in each year (29 of the 31 years), but the rate of change for both commodities from the preceding year also was nearly identical.

Statistical analyses of the prices of SBO and CSO during 1930-60 show nearly a perfect relationship between the two—a correlation coefficient of .988. CSO prices in this period explained virtually all of the variation (98 percent) in SBO prices. Because of the small standard error of estimate—.71—annual average SBO prices may be estimated reasonably accurately from CSO prices within the limit of the analyses. Turning the coin over, CSO prices may also be estimated accurately from SBO prices.

As shown in table 19, simple correlation analyses revealed that about 85 percent of the price variations of SBO and lard were associated. The percent of association between variations in the price of CSO and lard was 82.

### Seasonal Variation in Food Fat Prices

Average monthly prices of soybean oil, cottonseed oil, and lard tend to follow a distinct seasonal pattern, but the degree of variation is small compared with the seasonal variation in production, disappearance, or stocks. Among the three major food fats, CSO prices showed the greatest seasonal movement during 1950-60—a range of 14 percentage points from the annual average—and lard the least—7 percentage points. SBO prices varied 10 percentage points during the course of the marketing year.



Table 18.--Comparison of soybean oil, cottonseed oil, and lard price per pound, 1930-1960

Year	Soybean oil		Cottonseed oil		Lard price				
	price (crude, Decatur)		price (crude, Southeast mills)		(loose, Chicago)				
	:Change:		:Change:		Price		:Change:		
	Aver-	:from:	Aver-	:from:	as per-	Aver-	:from:	percentage of	
	age	preced-	age	preced-	centage:	age	preced-	Soy-	Cotton-
		ing		ing	of SBO		ing	bean	seed
	: year	: year	: year	: year		: year	: year	oil	oil
	Cents	Cents	Cents	Cents	Percent	Cents	Cents	Percent	Percent
1930	8.6	---	6.9	---	80	9.8	---	114	142
1931	5.5	-3.1	5.3	-1.6	96	7.2	-2.6	131	136
1932	3.1	-2.4	3.1	-2.2	100	4.2	-3.0	135	135
1933	5.4	2.3	3.7	.6	69	4.8	.6	89	130
1934	6.0	.6	5.6	1.9	93	7.4	2.6	123	132
1935	8.1	2.1	9.2	3.6	114	13.6	6.2	168	148
1936	7.5	-.6	8.6	-.6	115	10.7	-2.9	143	124
1937	8.1	.6	8.0	-.6	99	11.1	.4	137	139
1938	5.6	-2.5	6.7	-1.3	120	7.7	-3.4	138	115
1939	4.8	-.8	5.6	-1.1	117	6.0	-1.7	125	107
1940	4.7	-.1	5.3	-.3	113	5.0	-1.0	106	94
1941	8.5	3.8	9.5	4.2	112	8.6	3.6	101	91
1942	11.6	3.1	12.7	3.2	109	11.8	3.2	102	93
1943	11.8	.2	12.8	.1	108	12.8	1.0	108	100
1944	11.8	0	12.8	0	108	12.5	-.3	106	98
1945	11.8	0	12.8	0	108	12.8	.3	108	100
1946	14.6	2.8	15.8	3.0	108	19.1	6.3	131	121
1947	23.1	8.5	25.9	10.1	112	22.5	3.4	97	87
1948	22.2	-.9	25.3	-.6	114	20.3	-2.2	91	80
1949	11.0	-11.2	11.6	-13.7	105	11.3	-9.0	103	97
1950	14.0	3.0	15.8	4.2	113	11.8	.5	84	75
1951	16.8	2.8	18.4	2.6	110	16.1	4.3	96	88
1952	11.0	-5.8	12.8	-5.6	116	9.9	-6.2	90	77
1953	12.4	1.4	14.1	1.3	114	11.9	2.0	96	84
1954	13.3	.9	13.5	-.6	102	15.7	3.8	118	116
1955	11.6	-1.7	12.7	-.8	109	10.6	-5.1	91	83
1956	13.2	1.6	13.7	1.0	104	11.1	.5	84	81
1957	12.2	-1.0	13.5	-.2	111	12.4	1.3	102	92
1958	10.5	-1.7	12.7	-.8	121	11.4	-1.0	109	90
1959	9.0	-1.5	11.2	-1.5	124	7.9	-3.5	88	71
1960	8.8	-.2	9.9	-1.3	113	8.8	.9	100	89
Average:									
1930-1960	10.5	2.2	11.5	2.3	110	11.2	2.8	107	97
1931-1940	5.9	1.5	6.1	1.4	103	7.8	2.4	132	128
1959-1960	11.3	1.8	12.7	1.5	112	11.1	2.7	98	87

Table 19.--Summary of results of statistical analyses of the relationships between soybean oil, cottonseed oil, and lard prices per pound, 1930-1960

Food fat	Average	Change from preceding year	Dispersion	
			Standard deviation	Coefficient of variation
	Cents	Percent	Cents	Percent
SBO	10.5	21	4.5	43
CSO	11.5	20	5.3	46
Lard	11.2	25	4.2	38

Correlation Analyses					
Variables		Coefficients of--			Standard error of estimate
Dependent	Independent	Regression	Determination	Correlation	
SBO	CSO	.851	.977	.988	.707
SBO	Lard	.989	.849	.922	1.799
CSO	Lard	1.130	.821	.906	2.271

During 1950-60, lard prices showed a tendency to reach a peak in August-October of 103 percent of the annual average at a time when output was seasonally down. Prices then declined fairly steadily to 97 percent of the annual average in January, reflecting the seasonal peak in hog slaughter and lard production. Thereafter, prices tended to rise to a spring high of 102 percent in April before tapering off to the marketing year's low point of 96 percent in June. The disappearance of lard, as well as other food fats, is more pronounced than that for price, as each fat tends to be used during those seasons of the year when it is in heaviest supply and conversely, lowest priced. Disappearance of lard is the greatest during October-January at about 110 percent of the annual average (table 21).

Soybean oil and cottonseed oil prices tend to drop markedly during the summer months as new crop prospects unfold and the new crushing season approaches. For SBO, prices in recent years (1950-60) have decreased rather steadily on the average from the season's high index of 104 in April to a low of 94 in September, then increase slowly to the spring peak of 104. This seasonal price movement is partly associated (inversely) with available supplies of SBO, though other factors such as seasonal domestic requirements for food fats and oils and export demand exert important influences on the pattern of prices by months. Also, some variation in crushings occur during the season, depending on the price of oilseeds and oil and meal.



Table 20.--Soybean oil, cottonseed oil, and lard: Indexes of seasonal variation in average wholesale prices and price margins, by months, 1950-60 1/

Item	:Oct.	:Nov.	:Dec.	:Jan.	:Feb.	:Mar.	:Apr.	:May	:June	:July	:Aug.	:Sept.
<u>SBO</u>	:	:	:	:	:	:	:	:	:	:	:	:
(crude, Decatur)	:	:	:	:	:	:	:	:	:	:	:	:
Cents per pound	: 11.6	12.1	12.2	12.2	12.4	12.5	12.5	12.4	12.0	11.6	11.7	11.3
Index	: 96	100	101	102	103	104	104	103	100	96	97	94
<u>CSO</u>	:	:	:	:	:	:	:	:	:	:	:	:
(crude, S.E. mills)	:	:	:	:	:	:	:	:	:	:	:	:
Cents per pound	: 12.8	13.2	13.2	13.6	13.7	13.8	14.1	14.3	13.8	13.2	12.9	12.4
Index	: 96	98	98	101	102	103	105	106	103	99	96	92
<u>Lard</u>	:	:	:	:	:	:	:	:	:	:	:	:
(loose, Chicago)	:	:	:	:	:	:	:	:	:	:	:	:
Cents per pound	: 11.9	11.4	11.3	11.2	11.6	11.6	11.8	11.5	11.1	11.5	11.9	11.9
Index	: 103	99	98	97	100	100	102	99	96	100	103	103
<u>Price margin</u>	:	:	:	:	:	:	:	:	:	:	:	:
between SBO and--	:	:	:	:	:	:	:	:	:	:	:	:
CSO (cents per	: 1.2	1.1	1.0	1.4	1.3	1.3	1.6	1.9	1.8	1.6	1.2	1.1
Lard pound)	: .3	-.7	-.9	-1.0	-.8	-.9	-.7	-.9	-.9	-.1	.2	.6

1/ Indexes of seasonal variations computed on the basis of simple average prices in the marketing years for 1950-60. Data not adjusted for trend or price level.

Table 21.--Soybean oil, cottonseed oil, and lard: Indexes of seasonal variation in average production, disappearance, and stocks, by months, 1950-60

Item	:Oct.	:Nov.	:Dec.	:Jan.	:Feb.	:Mar.	:Apr.	:May	:June	:July	:Aug.	:Sept.
<u>SBO</u>	:	:	:	:	:	:	:	:	:	:	:	:
Production	: 104	104	104	107	99	105	101	102	95	93	95	92
Disappearance	: 109	97	91	103	104	100	96	100	108	86	105	100
Stocks	: 72	73	86	96	106	108	116	124	118	103	107	92
<u>CSO</u>	:	:	:	:	:	:	:	:	:	:	:	:
Production	: 170	162	142	145	122	107	82	58	42	34	40	95
Disappearance	: 72	89	102	112	118	120	122	117	108	93	80	66
Stocks	: 120	117	102	124	112	98	93	96	93	71	81	96
<u>Lard</u>	:	:	:	:	:	:	:	:	:	:	:	:
Production	: 103	113	124	120	98	106	97	94	90	83	84	88
Disappearance	: 111	108	110	111	90	101	95	90	94	92	100	100
Stocks	: 67	62	74	100	114	119	124	126	124	116	101	79

Seasonal variation in CSO production is considerably greater than in that of SBO; it ranges from a low of 34 percent of the annual average in July to a high of 170 in October whereas SBO ranges from a low of 92 in September to a peak of 107 in January. CSO prices usually drop sharply from July to August, the start of the new crushing season. The index numbers of CSO prices vary from the September low of 92 to a high of 106 in May. Output of CSO is heavy from September through February relative to the low production in May through August. Prices of CSO tend to rise towards the end of the marketing season, reflecting, in part, the limited availability of CSO.

#### Price Premium of CSO Over SBO Widens Seasonally

In most seasons, the price differential between CSO and SBO is small during the fall, when the output of both oils is heavy; after that, CSO usually works to a premium over SBO, as CSO output tapers off seasonally and supplies decline. The price spread then tends to narrow during the summer months as supplies of new crop oil are anticipated.

This seasonal variation in the price ratio between CSO and SBO is due primarily to differences in the storability of the seeds. Cottonseed cannot be held through the season without deteriorating, except by the use of cooling equipment, and therefore is usually crushed as rapidly as possible. This gives a highly seasonal pattern in crushings and oil output. In contrast, soybeans can be readily stored for a longer period without loss of quality and the volume of crushings is fairly uniform throughout the season.

During 1950-60, the premium of CSO over SBO averaged about 1.1 cents per pound for the months of August-December. It is during these months that the output of CSO is seasonally high. Beginning in January, the price spread widened and reached a peak of nearly 2.0 cents in May-June. In these months the output of CSO is tapering off seasonally. The margin tends to drop in July as new crop cotton oil in the early production areas of the Southwest becomes available.

The price margin between SBO and lard during July-October 1950-60 was fairly small, averaging 0.3 cents per pound. The price discount of lard to SBO then widened to nearly 1.0 cent per pound and remained fairly stable at this rate through June.



